Working Meeting to Address HIPPI-6400 Issues Only
Monday and Tuesday, February 3-4, 1997
San Jose, CA

1. Opening remarks and introductions

The Chairman, Don Tolmie of Los Alamos National Laboratory, opened this HIPPI-6400 meeting and thanked Bob Snively and Sun Microsystems for hosting this meeting. This group is constituted as both the HIPPI special working group (SWG) under X3T11, and the HIPPI Networking Forum (HNF) - Technical Committee (TC).

Don then lead a round of introductions. The list of attendees is at the end of these minutes.

2. Review / modify the draft agenda

The draft agendas were available on the web prior to the meeting. Hard copies were available at the meeting. James Hoffman of Los Alamos volunteered to take the meeting minutes for possibly the last time. A copper section was added to the agenda as item 7.2.

3. Review minutes of previous meetings

3.1 January 7-9, 1997, Phoenix, AZ

The Phoenix minutes were reviewed. Revisions to Roger Ronald's name, and page headings, were made. Don Tolmie took an action item to correct the January minutes on the HIPPI web page. Joe Parker moved and Henry Brandt seconded to accept the revised January minutes.

3.2 Review action items from Phoenix meeting

1. Greg Chesson and Fred Templin to provide ARP text for inclusion in HIPPI-6400-SC, and specify effects on bridging. (added Jeff Young to action item, in progress)
2. Greg Chesson to register the EtherTypes with INA / Xerox. (in progress)
3. Greg Chesson to have Art Beckman look into getting a 12-bit group of ULA's for HNF. (in progress)
4. Greg Chesson to present text to reflector to describe RTR setup using the Persistent bit. (Carryover)
5. Henry Brandt and Hansel Collins to collect values for completion of copper interface specifications. (Carryover)
6. Greg Chesson and Don Sanders to have SGI review the connector layout as it relates to the SuMAC chip. (Carryover)
7. Greg Chesson and Don Sanders to check all error states, e.g., what happens if a command is corrupted or lost. (Carryover)
8. Craig Davidson to add text to 4.10 of PH describing the 16-bit optical interface. (Carryover)
9. Craig Davidson to provide text describing how HIPPI-ST Sync values are chosen. (Done)
10. Greg Chesson to provide new text for the HIPPI-ST Notify and Interrupt flag bits. (Done)
11. Greg Chesson to provide new text for HIPPI-ST Op Retry and error processing clause. (Done)
12. Fred Templin to provide text describing the I / G and U / L bits in Figure 11 of PH. (Done)
13. Fred Templin to make sure that RFC 1700 lists all of the reserved ULA addresses used in HIPPI-6400. (Done)
14. Roger Ronald to email the reflector with burst boundary question for FP encapsulation of ST. (Done)
15. John Ellis to send the part number for the 100-pin Berg connector to Don Tolmie for inclusion in the document. (Carryover)
16. James Hoffman to make Al Widmer's worst-case bit patterns available on the HIPPI web page. (Done)
17. Jeff Young to review Cray driver requirements involving HIPPI-800 D1, D2 and burst boundaries. (Done)
18. Roger Ronald to update HIPPI-6400-SC Rev 0.7 with changes agreed to at the Phoenix meeting. (Done)
19. Don Tolmie to update HIPPI-6400-ST Rev 0.2 with the changes agreed to at the Phoenix meeting. (Done)
20. Don Tolmie to update HIPPI-6400-PH Rev 0.9 with the changes agreed to at the Phoenix meeting. (Done)

4. Review document changes since last meeting

These sections present new or controversial changes to each of the documents. The changes to the document prior to the meeting can be found in the corresponding change list at the front of each document.

4.1 HIPPI-6400-PH, Rev 1.0

Many of the word changes at the beginning of the document reflect Dean Liberty's comments reviewed last meeting. One comment asked for a combination of Figures 1 and 5, but the group rejected the idea as a bit too unwieldy with only a little gain. The group reviewed and accepted the rest of Dean Liberty's comments with only minor changes. Thanks go out to Dean for his careful review and insightful remarks.

Don talked about an updated service interface for the next draft of the document. The group agrees that the service interface needs to be fleshed out as certain companies are beginning device driver construction for HIPPI-6400.

In 7.2, Fred Templin noted that RFC 1700 may later have a new number. Fred took an action item to provide a more accurate reference for finding the most current assigned numbers for EtherType.

The new activity monitor section, 10.5, was moved into the new shutdown section. The text was revised and functionality and restrictions added. Section 12 on Reset, Initialize, and Shutdown will be split into two sections: section 12: Reset and Initialize and section 13: Shutdown and activity monitoring.

Hansel Collins presented a modified training sequence for HIPPI-6400. The 16-bit training sequence has a few minor changes to the Clock signal for easier detection. The 8-bit training sequence has been changed to look exactly like the 16-bit training sequence. No objections were made to the change at the meeting, but further comments are welcome.

4.2 HIPPI-6400-SC, Rev 0.8

Roger Ronald presented HIPPI-6400-SC revision 0.8. The group reviewed word changes and added minor revisions. Jim Davis' reflector comment about the checking an all F's address was also incorporated. Don Tolmie asked for global capitalization of "Admin" and capitalization conformance for both figure and table references.

The group also noted confusion between an element address, the word logical address, and their respective functions. Roger Ronald agreed to change all references to logical address to ULA and provide a better introduction on element addresses.

In 8.2.1, Michael McGowen noted that ULP's will have problems with two endpoints using the same ULA. Michael took an action item to address the problem and present text that fixes things.

4.3 HIPPI-ST, Rev 0.3

Don Tolmie presented revision 0.3 of HIPPI-ST with major modifications to section 4, collecting most ST functions into a single area.

Adding to the nits section, James Hoffman requested a change to the name Virtual Connection to reflect that a port was being setup. After much word haggling and failed suggestions, the name was left as Virtual Connection.

As a positive name switch, the group declared that an STU only applies to the data payload portion (and not the scheduled headers) of a data operation. The overall entity containing both the scheduled header and the data payload (now called STU) will be called a "Data operation".

In 4.3.6, the group agreed that the actual number of slots at the destination can dynamically change and communicate the change in a state response, but most implementations will not use this option.

In 4.4.2, a transfer identifier value of zero is reserved for commands that don't deal with a specific transfer.

In 4.4.4, it was noted that blocks can be striped, acknowledged, and retransmitted. The group may need a section on block operations detailing these operations. Greg Chesson took an action item to provide text on block acknowledgment and retransmission.

In 4.4.6, the second to last sentence specifying sizes for all except the first and last STU's was dropped as

it placed an unwanted requirement on sending STU's. The following open issue was also deleted.

Section 4.5.3 is new and suggests that all rejected operations use the State_Response command with reject set. The group noted that this may require more state and that possibly rejecting RTR should be fixed instead. Greg Chesson took an action item to compare the two possibilities. The group will leave reject under State_Response until the issue can be further studied.

In 6.1 and 6.2, two changes were made to the parameters sent in a DATA operation. The OS_Bufx and OS_Offset fields will carry ULP parameter payload to aid data operation processing. Also the D flag bits will carry data channel assignment declared in the RTS so that DATA operations can be routed across any topology without the intermediate nodes having to remember state..

In 6.2, the Interrupt and Notify text was reviewed and edited for clarity. The Interrupt and Notify bit orders were switched to ease understanding. The Source_Concatenate and Concatenate bit order was also changed to promote clarity. Finally, the group felt that restricting Data Channel sizes in ST to the same mapping in HIPPI-6400-PH will benefit ST transfers, and agreed to copy the HIPPI-6400-PH text to the ST document. Data Channel 0 is now disallowed for sending data as only Control operations should be sent over the first channel.

In 8.3, the group discussed the Request_to_Receive functionality and semantics. In order for RTR to work, an RTS with persistent set must be sent first asking for an RTS_Response with a buffer region to perform buffer gets. The text will be extended as part of Greg Chesson's RTR action item.

In 9.1, the Op-retry timeout was renamed to Op-timeout. The group also requested a separate timeout for control operations expecting control operations and control operations expecting data operations. A new timeout value will be added with guidelines for determining both timeouts. A clarification in 9.1 will specify that the Op-timeouts are system and Port dependent for each Virtual Connection.

Greg Chesson took an action item to investigate how long an Originating Source should keep buffers for possible retransmission.

4.3.1 Annex B, using HIPPI-FP as the lower layer

Craig Davidson did not have time to complete revisions to his HIPPI-FP translation specification from the last meeting, but plans to have a new revision for the next meeting.

The group decided that the specification will call for short burst last for legacy HIPPI ST transfers. Only specific IPI-3 drivers require a short burst first to separately process D1 headers and this doesn't apply to HIPPI-ST. For installation with old drivers that require a separate D1 burst, the originating device or a translator could pad the first burst to maximum burst length, allowing a short burst last and conformance to the new standard.

5. HIPPI-6400 Optical

The following agenda items were discussed during the optical portion of the meeting: eye safety, electrical I/O specifications, voting rules, connector presentation reprise (10 minutes each), connector voting rules, the actual voting, and future planning. Stan Swirhun took complete minutes of meeting which should be available at Don Tolmie web page before the next meeting.

Major highlights involved an optical specification presentation from AMP that would negate the need for open fiber control and the selection of the MTP connector for the optical standard.

6. HIPPI-6400 MIB, Rev 0.3

Von Welch's latest MIB revision was available on the web before the meeting. Michael McGowen expressed interest in unifying the format and parameters between all HIPPI related MIBs. E-Systems noted that they are basing their HIPPI-6400 switch MIB on Von Welch's end point MIB.

7. Other items

7.1 Moving physical media dependent portions of HIPPI-6400-PH to other documents

Revisiting last meetings decision, the group decided to leave the copper portion in the document, but

split the optical portion out. The perceived benefits included:

- The PH document with copper can be forwarded by June.
- The new optical document, HIPPI-6400-OPT, can be applied easily to other upper layer interfaces, e.g., gigabyte Ethernet or a parallel optical fiber channel.
- The optical group will have their own document, still edited by Don Tolmie, to review in optical meetings without wading through the PH specification.

The group decided that the electrical interface (possibly A-PECL) will be included in the PH document as an informative annex.

Craig Davidson moved and Roger Ronald seconded to perform the above split to the HIPPI-6400-PH document. Motion passed; 6 for, 0 opposed. Don Tolmie took an action item to draft a Project Proposal, and first draft of a new HIPPI-6400-OPT document.

7.2 HIPPI-6400 Copper

Michael Karg of Montrose presented their quad-ax cable test results. The results compare well with the Gore cable. The Montrose results can be seen at: http://www.ziplink.net/~mikekarg/Hippi6400/hippi6400.html, and is also referenced through the HIPPI web page.

John Ellis of Berg presented their 35 degree exit cable drawing. The cable thickness was reduced to meet the .75 inch requirement. John Ellis noted that they would offer cables with the 35 degree exit on one or both ends. A right angle receptacle design was also shown. Berg is testing the overmold process to make sure cable integrity is undamaged. Samples should be available soon.

The backshell connection was questioned, but later answered by text under 15.5 of PH. Figure 18 shows the overall shield connection and needs a little clarification and should show the backshell connection. The capacitor values that AC couple the overall shield on one end were set by Berg as 0.4 uF at 50 volts using at least 2 capacitors.

The pin layout shown in figure 19 of PH was reviewed and it was noted that signal pin values may need to be placed closer to neighbor signal, e.g., data signal 7 isn't very close to data signal 8. SGI still has the action item to match the pin layout with their SuMAC pin layout. The label of no connection (n.c.) in Figure 19 means that neither the cable or the receptacle will have any connection on those pins.

The text in clause 15 of PH (Copper interface) was reviewed with minor corrections.

Figure 20 of the Berg connector was reviewed with a few revisions. John Ellis provided a drawing for the receptacle which Don Tolmie will add into the document.

8. Future meeting schedule

8.1 **March 4-6, 1997, San Jose, CA**

This interim meeting will cover HIPPI-6400 issues, with **emphasis on copper starting at 1 PM on Wednesday.**

Tuesday, March 4 — 1 PM - 9 PM
Wednesday, March 5 — 8 AM - 9 PM
Thursday, March 6 — 8 AM - 5 PM

Note that an extra day has been added.

The location is in the Courtyard by Marriott, at the San Jose Airport. Barbara Weber and Berg are the host. (See the meeting announcement on the web page at http://www.cic-5.lanl.gov/~det/ for further details.)

8.2 April 7-8, 1997, Palm Springs, CA

During the X3T11 April plenary week , the following HIPPI meetings are scheduled:

Monday, April 7 -
1 PM - 9 PM — HIPPI-6400

Tuesday, April 8 -
8 AM - 2 PM — HIPPI-TC General and -6400
2 PM - 5 PM — HIPPI-6400 Optical
5 PM - 9 PM — HIPPI-6400

The location is the Hyatt Regency Suites in Palm Springs, CA. Jeff Stai and Brocade are the host (See the meeting announcement on the web page at http://www.cic-5.lanl.gov/~det/ for further details.)

8.3 Future meeting dates and locations

The following 1997 X3T11 plenary week dates are firm. Recent changes to this list are underlined to make them easier to find.

1997 –

Mar 4-6	Interim	San Jose, CA	Berg
Apr 7-8	Plenary	Palm Springs, CA	Brocade
May 13-15	Interim	Mt. View, CA	SGI
Jun 9-10	Plenary	Seattle, WA	Boeing
July 8-10	Interim	Minneapolis, MN	Cray
Aug 4-5	Plenary	Honolulu, HI	Hitachi
Sep 9-11	Tentative	Albuquerque, NM	Los Alamos
Oct 6-7	Plenary	Tucson, AZ	FSI
Nov 4-6	Tentative	Dallas, TX	E-Systems
Dec 8-9	Plenary	Orlando, FL	DPT

If interim September and November meetings are needed, Los Alamos and E-Systems have agreed to host in Albuquerque and Dallas respectively. A decision will be made at a later meeting.

The 1998 schedule is less firm, but here is what is currently being considered by X3T11 for the plenary meetings. Question marks note the ones that are still in question. Hopefully HIPPI-6400 will be far enough along that we will not need interim working meetings.

1998 –

Feb 9-10	Plenary	San Diego	Qlogic
Apr 20-21	Plenary	Palm Springs, CA	Brocade
Jun 8-9	Plenary	St. Petersburg Beach, FL	AMP
Aug 10-11	Plenary	??	??
Oct 5-6	Plenary	Ft. Lauderdale, FL	Adaptec
Dec 7-8	Plenary	??	??

9. Review action items

All of the following action items apply to HIPPI-6400.

1. Fred Templin, Jeff Young, and Greg Chesson to begin an IP / ARP over HIPPI-6400 RFC.
2. Greg Chesson to register the EtherTypes with INA / Xerox.
3. Greg Chesson to have Art Beckman look into getting a 12-bit group of ULA's for HNF.
4. Greg Chesson to present text to reflector to describe RTR setup using the Persistent bit.
5. Henry Brandt and Hansel Collins to collect values for completion of copper interface specifications.
6. Greg Chesson and Don Sanders to have SGI review the connector layout as it relates to the SuMAC chip.
7. Greg Chesson and Don Sanders to check all error states, e.g., what happens if a command is corrupted or lost.
8. Craig Davidson to add text to 4.10 of PH describing the 16-bit optical interface.
9. Don Tolmie to correct the January meeting minutes on the HIPPI web page.
10. John Ellis to send the part number for the 100-pin Berg connector and receptacle to Don Tolmie for inclusion in the document.
11. Fred Templin to provide accurate reference in 7.2 of PH for "assigned numbers".
12. Michael McGowen to review 8.2.1 of SC and present a fix when two directly connected end points try to use the same ULA.
13. Greg Chesson to draft initial text for Block acknowledge / retransmission functions.
14. Greg Chesson to compare putting all Operation rejects in State_Response's vs. in expected responses, e.g., Request_Port_Response with Reject = 1.
15. Greg Chesson to investigate how long an Originating Source should keep buffers for possible retransmission.
16. Don Tolmie to draft a Project Proposal and initial HIPPI-6400-OPT draft document.
17. James Hoffman to finish revising ST Annex C for the next revision of ST.
18. Roger Ronald to update HIPPI-6400-SC Rev 0.8 with changes agreed to at the February meeting.
19. Don Tolmie to update HIPPI-6400-ST Rev 0.3 with the changes agreed to at the February meeting.
20. Don Tolmie to update HIPPI-6400-PH Rev 1.0 with the changes agreed to at the February meeting.

10. Adjournment

The group adjourned at 6:30 p.m. and noted how few technical changes were made to all three of the 6400 documents.

11. Attendance (HIPPI-TC, HIPPI-6400, and HIPPI Optical)

Jeff Conley	3M	512-984-6989	jconley1@mmm.com
Michael Griffin	3M	612-733-6004	megriffin@msmail.mmmg.com
Earl Hayes	Alcoa-Fujikura Ltd.	864-433-5412	
Ron Klechowski	Alcoa-Fujikura Ltd.	803-433-5332	klecko01@ssw.alcoa.com
Mackie Shiflett	Alcoa-Fujikura Ltd.	864-433-5939	shifle01@ssw.alcoa.com
Bob Atkinson	AMP	717-592-4274	rdatkins@amp.com
Charles Brill	AMP	717-592-6198	cebrill@amp.com
Daniel Brown	AMP	717-986-7812	dan.brown@amp.com
Shelly Buchter	AMP	717-986-5034	shelly.buchter@amp.com
Jim Kevern	AMP	717-986-5701	james.kevern@amp.com
Alan Plotts	AMP	717-986-7985	alan.plotts@amp.com
Jack Andrews	Andrews Associates	770-939-1482	
Ed Cady	Berg	503-359-4556	EdCady@aol.com
John Ellis	Berg	717-938-7512	Ellis825@aol.com
Michael Karg	Cable Design Technologies	508-791-3161	mikekarg@montrose-cdt.com
Kurt Witte	Ciprico	612-551-4069	
Carol McGill	Corning	607-974-4939	mcgill_cl@corning.com
Jeff Young	Cray Research Inc.	612-683-5536	jsy@cray.com
David Hyer	Digital Equipment Corp	508-493-6139	hyer@exchange.eng.pko.dec.com
Raju Bopardikur	Discreet Logic	514-272-0525	raju_bopardikur@discreet.com
Lawrence Foltzer	DSC Communications	707-792-7228	larry_foltzer@optilink.dsccs.com
John Gibbon	Essential Communications	505-344-0080	jgibbon@esscom.com
Michael McGowen	Essential Communications	505-344-0080	mikemc@esscom.com
J.J. Dumont	F.C.I. / F.C.F.	011-33-1-39492071	jdumont@iway.fr
Joe Salamone	Framatome Connectors	603-746-3512	jsconnect@aol.com
Chris Simoneaux	Fujikura	770-956-7200	chris@fujikura.com
Hari Naidu	Fujikura Technology Am.	408-988-7420	hari@fujikura.com
Donald Woelz	Genroco, Inc.	414-644-2505	don@genroco.com
Randy Hardy	Harris	407-984-5654	rhardy@harris.com
Francois Gaullier	Hewlett Packard	+33 4-7614-5181	Francois_Gaullier@hp.com
Greg Huff	Hewlett Packard	972-497-4530	huff@convex.hp.com
Steve Joiner	Hewlett Packard	408-435-6421	STEVE_JOINER@HP-SanJose-om1.om.hp.com
John Bowerman	Honeywell	972-470-4553	jbowerma@micro.honeywell.com
Henry Brandt	IBM Poughkeepsie	914-433-7684	hrap@vnet.ibm.com
Ron Soderstrom	IBM	507-253-6290	rons@vnet.ibm.com
James Hoffman	Los Alamos National Lab	505-665-8557	jamesh@lanl.gov
Don Tolmie	Los Alamos National Lab	505-667-5502	det@lanl.gov
Wallace Carlisle	Lucent Technologies	770-798-2668	awcarlisle@lucent.com
Vince Melendy	Methode Electronics	617-273-2650	72540.1774@compuserve.com
Rich Parks	Motorola, Inc.	602-732-5152	rcw670@email.sps.mot.com
Glenn Raskin	Motorola	602-732-2880	RXFA30@email.sps.mot.com
Daniel Schwartz	Motorola	602-413-5320	a186aa@email.sps.mot.com
Fred Templin	NASA Ames	415-604-6514	templin@nas.nasa.gov
Yasuo Sasaki	NTT International	03-5956-9025	ysasaki@htti.co.jp

Joe Parker	Optivision	415-855-1775	parker@optivision.com
Sherman Zhu	Optobahn Corp.	310-782-9500	xzhu@optobahn.com
Ellen Lapham	Page Automated Telecom Sys	408-773-9481	ev?lapham@aol.com
Pat Wienier	Page Automated Systems	408-773-9481	
Craig Davidson	Raytheon E-Systems	214-205-4166	davidson@esy.com
Roger Ronald	Raytheon E-Systems	972-205-8043	rronald@esy.com
Hank Dunnenberger	Siecor	704-327-5267	h_dunnenberger@siecor.com
Todd Hudson	Siecor	704-327-5815	todd_hudson@siecor.com
Klaus Schulz	Siemens	49-30386-26333	
Schelto van Doorn	Siemens Fiber Optic	408-725-3436	schelto@siemens-fo.com
Greg Chesson	Silicon Graphics	415-962-3496	greg@sgi.com
Jeffrey Chung	Silicon Graphics	415-933-3823	jdchung@sgi.com
Hansel Collins	Silicon Graphics	415-933-2921	hac@engr.sgi.com
Craig Dunwoody	Silicon Graphics	415-933-3635	dunwoody@sgi.com
Chris Satterlee	Silicon Graphics	415-933-2606	csatt@sgi.com
Wally St.John	Silicon Graphics	415-933-7613	wbs@eng.sgi.com
Ali Ghiasi	Sun Microsystems	415-786-3310	ghiasi@eng.sun.com
Albert Kelley	Tensolite	904-829-5600	kelley@tensolite.com
Don Knasel	U.S. Connect	704-323-8883	dknasel_conec@msn.com
Toshiaki Satake	U.S. Connect	704-323-8883	Toshiaki.satake@hickory.net
Mark Stratton	Vixel	303-464-2274	
Stan Swirhun	Vixel	303-464-2276	sswirhun@vixel.com
Ken Wirgler	Ward / Davis Comm	310-297-5990	kenwdc@aol.com
Craig Theorin	W.L. Gore and Associates	302-368-2575	ctheorin@wlgore.com